76-77

Arts

concordia university

Sir George Williams
Faculty of Arts

Psychology: First Year Undergraduate Research Projects

SIR GEORGE WILLIAMS FACULTY OF ARTS

PSYCHOLOGY DEPARTMENT

UNDERGRADUATE STUDENT
RESEARCH PROJECTS

This booklet has been prepared to give prospective students an idea about the kinds of independent study which first year undergraduates have been doing in the Department of Psychology. Having the opportunity as a student to collect and analyze data about a real problem can provide a learning experience which teaches the student about both the rewards and frustrations of trying to find out how things work.

January 1976

TABLE OF CONTENTS

Page

Faculty - Department of Psychology 4

Description of the Department 5

Psychology 271 Projects 10

Self-destructive behaviors and their relationship to thoughts on suicide. J.M. Blurton 11

Investigation into the effect of a multi-vitamin complex upon the activity of a group of 48 Ss as measured by a galvanic skin response indicator. I. MacLeod 15

The effects of city-street-noise on persistence and performance efficiency on complex tasks. J.L. Bryan and G. Tomasino 20

The effects of age on pain endurance with and without suggestion. C.A. Beuglet 25

Relation between fear and imagery. S. Mastoras, J. Foley, and L. Dubois 28

The effects of downward shifts of reward upon the maze learning and performance of male, albino mice. R. Clayman 32

With isoproterenol, is anxiety and nervousness a result? J. Jarbath, C. Pozezanac, L. Ivaskiv, and P. Usereau 37

Stress and achievement. J. Freder, C. Lightstone, S.A. Levine, K. Flam 41

A study of retroactive inhibition. G. Barnard, A. Johnson, and M. Morrison 46

The effect of suggestibility on the performance of introverted and extroverted children in an arithmetic test. J.P. Currie, K. Kirchlof, D. Luke, and J.P. Talarmin 49

The effects of adrenaline on electric shock tolerance in rats. A. Zimakas 54

Page

A study of equivalence formation of drawings in children. P. Elbaz, M. Emmett, and M. McKeouin 61

Experimental aesthetics. K. Sheridan and W. Iacurto ... 64

Overcrowding and aggressive behavior in grade five boys. M. Steinberg and I. Pencer 68

Aggression as a function of birth-order. B. Lewittes and J. Donahue 74

DEPARTMENT OF PSYCHOLOGY

Associate Professor of Psychology and Chairman of the Department
June Chaikelson, Ph.D. (McGill)

Professors
A. Harold Goldsman, Ph.D. (N.Y.U.)
Gerald Mahoney, Ph.D. (McGill)
Alex Schwartzman, Ph.D. (McGill)
Jane Stewart, Ph.D. (London)
Joseph P. Zweig, Ph.D. (Columbia)

Associate Professors
Zalman Amit, Ph.D. (McGill)
David Andres, Ph.D. (Waterloo)
Gabriel R. Breton, Ph.D. (Michigan)
Dolores Gold, Ph.D. (Saskatchewan)
Thomas Gray, Ph.D. (Simon Fraser)
Anthony Hilton, Ph.D. (McMaster)
William R. Hooper, Ph.D. (Toronto)
Tannis T. Maag, Ph.D. (Toronto)
Stan R. Munoz, Ph.D. (Waterloo)
Erat S. Nayar, Ph.D. (Mysore)
Campbell W. Perry, Ph.D. (Sydney)
Nancy D. Taylor, Ph.D. (McGill)
Roy A. Wise, Ph.D. (McGill)

Assistant Professors
William Brender, Ph.D. (McGill)
Michael Bross, Ph.D. (Manitoba)
Edward M. Brussell, Ph.D. (New School for Social Research, NY)
Alfonso Caramazza, Ph.D. (Johns Hopkins)
Anna-Beth Doyle, Ph.D. (Stanford)
Dorothy Haccoun, Ph.D. (Ohio State)
Henry Lavigueur, Ph.D. (Illinois)
Jane Ledingham, Ph.D. (State University of NY at Stonybrook)
Norman Segalowitz, Ph.D. (Oxford)
Pete Seraganian, Ph.D. (Dalhousie)
Peter Shizgal, Ph.D. (Pennsylvania)
Maxwell Taylor, Ph.D. (Liverpool)

Associate Professor of Education and Psychology
Donna R. White, Ph.D. (Pittsburgh)

Adjunct Assistant Professor
George Nemeth, Ph.D. (McGill)

Lecturer
Thomas G. Bowman, M.A.

The Department

The psychology department has 26 full-time faculty members all of whom hold Ph.D. degrees. Our areas of specialization range from the analysis of the brain mechanisms that control hunger and thirst to the study of what happens to children when their mothers work outside the home. Our research is supported by all major Canadian granting agencies including the Canada Council, the National Research Council and the Quebec Ministry of Education. Although we have a strong commitment to research, our strongest commitment is to our students. All of us teach our own courses, do our own marking, supervise our students' research projects ourselves and have regular office hours when students can come and talk to us. The lab sections of the courses in Statistics (Psychology 241 or 242) and Experimental Psychology (Psychology 271) are taught by graduate students, but even here the professor plans the labs and oversees the grading. Thus, we are able to get to know our students as individuals.

The psychology department is located in parts of the 5th, 9th, 10th and 11th floors of the Hall Building and on the 2nd floor of 1374 Sherbrooke Street. The main office is in Room 541, Hall Building (opposite the escalator) and the main laboratories are on the 5th and 11th floors. Almost all classes are held in the Hall Building. The reason the department is housed in different locations is because it has been developing new projects faster than the university can find large blocks of space to put them in. Our major projects currently are the new graduate programme, the Applied Psychology Center, and the Centre for Research on Drug Dependence. Over the past several years we have built up our library holdings and we have all the equipment that a department which is teaching laboratory courses should have.

Teaching

Psychologists as a group have been innovators in teaching methods, and this is reflected in the diversity of methods of teaching that you will find in the department. Most of our courses are a mixture of lectures and seminars, but the exact proportion of each in the "mix" varies with the subject matter and the professor. To maintain our ability to be flexible in our teaching, we try to keep enrollment in our advanced courses low, preferably about 30 and definitely not more than 50. The requirements of courses also vary, but final grades are typically based on a variety of indices including any or all of tests and exams, research projects, term papers, and seminar presentations. Most professors in the department evaluate their teaching by having their students fill in a course evaluation questionnaire which asks students to rate several aspects of the professor and the course. We also make up a profile for the department based on all courses which have been evaluated. Last year, when rated on a scale where "1" was "excellent", "3" was "fair", and "5" was "very bad", the teachers of the department received a median rating of 1.9 and the courses offered by the department received a median rating of 2.2.

Programmes

At the undergraduate level we offer major and honours programmes leading to the Bachelor of Arts or the Bachelor of Science degree. We also offer a minor, which can be combined with a similar component in another field to meet the requirements of the BA degree.

Admission Requirements

Students entering any psychology programme directly from the CEGEP level must have completed:

Psychology 101
Psychology 201
Biology 301 or 921
Mathematics any two CEGEP mathematics courses (Statistics is acceptable)

If you do not completely fulfill these requirements, you may be allowed to enter the programme, but you will have to make up the courses you are missing as part of your undergraduate studies.

Initial acceptance into the honours programme is based on your previous grades, but students who do well in the first year of the major programme are able to transfer into honours in their second year without any problem.

Students taking a Bachelor of Science degree must have, in addition to the CEGEP courses listed above, those courses required for admission to the Faculty of Science (see University Calendar).

Courses

The courses making up honours and major programmes in psychology are as follows:

(a) Honours:

Psychology 273	(Experimental)
Psychology 241(2)	(Statistics)
Psychology 412	(History)
Psychology 413	(Contemporary Problems)
Psychology 472	(Honours Thesis)

Plus four other courses in Psychology

(b) Major:

Psychology 271	(Experimental)
Psychology 412	(History)

Plus five other courses in Psychology

(c) Minor:

Psychology 271	(Experimental)

Plus four other courses in Psychology

Note: Students taking a BSc degree are required to combine their major or honours programme with a set of courses in mathematics-statistics or in biology-chemistry (see calendar).

When you come to register for your courses, we will discuss them with you and help you to plan your programme.

Career Opportunities

A Bachelor's degree in psychology will not admit you directly to a profession, but it does provide a stepping stone to many professions. While many of our honours students and some of our major students do go on for advanced degrees in psychology at graduate schools in Canada, the United States and Europe, many other students find that specialization in psychology is a useful background for a variety of different professions. For example, in this year's Honours class there are students planning careers in Law, Medicine and Dentistry as well as Psychology. Other fields which students with a major or honours degree in psychology frequently enter include education, social work, community service, business, industry and the civil service.

Undergraduate Courses in Psychology

Introductory Psychology
Selected Problems in Learning and Motivation
Selected Problems in Individual Differences
Statistical Methods in Psychology
Experimental Psychology
Selected Problems in Development
Selected Problems in Social Psychology
Selected Problems in the Application of Psychology
Modern Psychology in Historical Perspective
Contemporary Problems in Psychology
Learning
Motivation
Sexual Differentiation
Measurement in Psychology
Perception
Cognitive Processes
Developmental Psychology
Social Psychology
Personality
Behavior Disorders
Physiological Psychology
Comparative Psychology
Advanced Experimental Problems
Psychology of Work Organizations
Psychology of Human Learning in the Classroom

Information

For further information about B.A. or B.Sc. Major or Honours in Psychology, telephone 879-4146.

Psychology 271 Research Projects

Psychology 271 is a course in experimental psychology in which undergraduate students get their first exposure to research in psychology. Some 300 students are enrolled in this course. During the last eight weeks of the course, the students, either individually or in small groups carry out an independent research project which they themselves design, execute and analyze.

Over ninety such projects were submitted during the academic year 1973-74 in partial fulfillment of the requirements of the course. Twenty-five projects merited the mark A, and of these, 15 were summarized and presented in this collection.

Self-Destructive Behaviors And Their Relationship to Thoughts On Suicide.

June M. Blurton

In western cultures suicide has generally been regarded as an undesirable act. Durkheim and Freud explored it from differing points of view. Both regarded it as an "irrational" act. Jacobs, however, sees it as rational, the final resort after all other adaptive techniques have failed.

The use of drugs, alcohol, cigarettes and excess food can all be regarded as adaptive techniques for coping with the tensions of living; but they can also be regarded as self-destructive behaviors, since medical science warns that they may lead to a breakdown in body function.

For this study it was hypothesized that the conscious thoughts of teenagers and adults about suicide would not be significantly related to their self-destructive behaviors, and further that this lack of relationship would be more marked among the teenagers.

Subjects: There were two groups of subjects. The first group was composed of 21 students, mostly 15 years old, from a 10th grade High School class in Human Relations. The second was a group of 17 adults, from the same socio-economic background, who had completed their education prior to 1966.

Materials: A questionnaire containing a 7-point scale was devised. It required the subjects to rate their dependence on 9 culturally used drugs, including alochol and cigarettes, and on over-eating and snacking. The same scale was used to measure their thoughts and feelings on the likelihood that they would commit suicide (Suicide A); on the justifiability of committing suicide (Suicide B); on their ability to endure pain; dying for one's country; capital punishment; euthenasia; and an estimate of their body weight in relation to the normal.

Procedure: The 10th graders were given their questionnaire during class. The adults had theirs delivered to their homes; but with each group great care was taken to keep the answers anonomous, and this aspect was stressed to the subjects. With both groups a post-experimental inquiry was held.

Results: Since the scores obtained from the questionnairers did not lend themselves to parametric analysis Rank Order Correlations and Mann*Whitney U tests were used to test for significance. A comparison of the scores for Self-destructive behaviors and Suicides A and B combined showed results of .424 and .149 for 10th graders and adults respectively, and in both cases the p was 7 .05.

A Mann-Whitney U test comparing the scores for Self-destructive behaviors of 10th graders with those of adults produced U 107. A second Mann-Whitney comparing the same behaviors, but excluding dependence on Marijuana and Hashish, produced U 142.5. A third comparing the combined Suicide scores for 10th graders with those of adults showed U 161. In all these cases the significant U was 105 and the Null hypotheses were accepted.

The relationships between some the other scores from the questionnaire were also tested. Drug dependence, that is the Self-destructive scores with the over-eating and weight categories excluded, was compared with pain endurance; drug dependence was compared with willingness to die for one's country; capital punishment was compared with Self-destructive behaviors. In all these cases the Null hypotheses were accepted.

Using Mann-Whitney U tests it was found that there was no significant difference between 10th graders and adults in over-eating and snacking; in dependence on alcohol; or in dependence on cigarettes. There were, however, three instances in which the Null hypothesis was rejected. These involved a comparison between Suicide A and Suicide B for both groups where it was rejected at the 1% level; and a comparison of Drug dependence between 10th graders and adults where it was rejected at the 5% level.

Discussion: In discussing this study it must be remembered that neither of the groups is representative of the general population. The 10th graders, according to the Human Relations counsellors, are either having more than average psychological problems, or are brighter and more self-aware than the average 10th grader. The majority of the adults are college graduates, living in a suburb which is known as being very conservative. They all finished their education prior to 1966, when the drug culture was becoming the "In" thing. They were used as a comparison with the 10th graders to see whether or not there really is a generation gap.

The post-experimental inquiry, based on what the S's thought the questionnaire was measuring, produced a wide variety of answers, none of which closely approximated the experimental hypothesis. It was deemed, therefore, that Demand Characteristics did not influence the answering of the questionnaires for either group.

The 7-point scale was used to avoid the bunching which is a tendency on 3 and 5-point scales. The question of obtaining honest replies was tackled in three ways. The safeguards for maintaining anonomity were explained to the S's and were adhered to; emphasis was laid on the fact that the E was interested in the reactions of the individual S to the questions; and the wording of the questionnaire was non-judgemental. Various indications obtained by the E substantiated the feeling that the replies were probably as honest as the S's could make them.

The basis for the statistical analysis of the study lies in the replies to three questions; the multiple replies which make up Self-destructive behaviors; the replies to Suicide A, that is the likelihood of an individual S committing suicide; and the replies to Suicide B, the justifiability of suicide in general.

The scores for Suicide A are grossly positively skewed, indicating that the majority of the S's would not resort to suicide. It is felt that western culture inhibits this behavior so strongly that this distribution would continue to be positively skewed, no matter how large the sample. In fact, the proportion of real suicides to the population bears this out. Suicide B is negatively skewed indicating a feeling that people should be allowed to make their own choice on this matter. Here again it is felt that this skew would also be found in a large sample, since these views come from a conservative area and are not limited to the under-20's. The scores for both groups in Self-destructive behaviors are very scattered. In both groups, however, the Mean and the Median are close to each other and very near the center of the distribution. It is felt that in a large sample, the distributions would approximate the normal curve.

With these facts in mind, it is not surprising that there is no significant difference between the two groups. It has not been shown that the experimental hypothesis is valid; that either 10th graders or adults think one thing about suicide and do another. What is surprising, considering the views of parents and editorial writers, is that there is no significant difference between the Self-destructive behaviors of the two groups. Admittedly the results were borderline, but the only component of Self-destructive behaviors which did show a significant difference was drug usage.

The questionnaire itself may have contributed to these results. The questions on Self-destructive behaviors are neither sufficiently inclusive nor subtle. Categories for poor driving habits and accident proneness could have been included. More importantly, the questions on Self-destructive behaviors were relatively factual, whereas those on suicide, capital punishment, etc, were more theoretical. These questions might have yielded more valid scores had they been put in a situational form.

A fishing expedition, using scores not directly related to the experimental hypothesis, produced few unexpected results. A comparison between drug usage and willingness to die for one's country showed no significant differences despite the pacifism among drug users a few years ago; neither did a comparison between Self-destructive behaviors and capital punishment; nor between pain endurance and drug dependency.

In summary, it was hypothesized that there would be a difference between what adults and teenagers thought about the justifiability of committing suicide and their own likelihood of doing so on the one hand, and their Self-destructive behavior on the other. This was not shown to be the case. Neither was it shown that teenagers are more self-destructive than are adults.

As far as this study is concerned, at least, there appears to be less of a generation gap than is generally believed.

Investigation Into The Effect Of A Multi-Vitamin Complex Upon The Activity Of A Group Of 48 Ss As Measured By A Galvanic Skin Response Indicator.

Iain MacLeod

Hoffer and Green (1970) found that disturbed children, hyperactive and with deteriorating performance in school, responded well to large dozes of Vitamin B3 and when, unknown to the children, a placebo pill was substituted, regression was apparent within 30 days. Hebb (1972) discussing research with hyperactive children, reported that the condition could be helped considerably by a drug treatment which surprisingly was neither a tranquilizer nor a depressant but rather a stimulant. This discovery, taken in conjunction with Hoffer and Green's experiment, would seem to indicate that Vitamin B3 is perhaps capable of producing a stimulative effect.

The purpose of the present experiment was to determine if indeed there is any significant effect in human Ss as a result of oral vitamin consumption. A suitable measure of stimulative effect is considered to be the Galvanic Skin Response Indicator (GSRI) which measures electrical resistance (or its reciprocal, conductance) of the skin, usually of the palms of the hands. Skin resistance ranges from a high level in sleep to a low level in strongly activated states like rage (Davis and Kantor, 1935). Further, a large mass of evidence indicates that the sweat glands are innervated by post-ganglionic fibres of the sympathetic nervous system (McCleary, 1950; Lindsley, 1951) and, insofar as this system tends to discharge as a unit, the skin resistance to electricity is a measure of sympathetic activity. One would therefore expect an increase in the level of stimulation to result in a decrease in the resistance to the flow of electricity through the palmar area.

Method

Subjects: The Ss were 24 male and 24 female adults and children of mixed cultural origin, ranging in age from 12-60 years. All were non-vitamin consumers.

Apparatus: The GSRI consisted of an ohmmeter connected to a 0-5lbf pressure indicator. Resistance measurements of 0-1000 could be obtained on an X.1K scale. Copper electrodes (1 1/2" x 1") were soldered 1/2" apart onto the pressure indicator. Vitamin B with C Fortis capsules of composition: 35mg Thiamine (Vit. B1)-- 12mg Riboflavin (Vit. B2)-- 50mg Niacinamide (Vit. B3)-- 5mg Pyridoxine (Vit. B6)-- 10mg Vit. B12-- 20mg Calcium-d-Pantothenate-- 300mg Ascorbic Acid (Vit. C)-- Placebo capsules of Corn Starch B.P. Composition (supplied by ICN Canada Ltd.)

Procedure

GSRI readings were taken for each of 43 Ss on alternate days of the first week of the experiment to determine if an uncontrolled non-random variable was present in the experimental situation. An F test of variance was used for this purpose.

Ss were required to place their right palms on the GSRI electrodes (point of contact was held constant) and to press down on the pressure guage until a 4lbf pressure was obtained. Ss readings were recorded at the moment the GSRI needle stabilized. Room temperature was considered a variable and held constant at 70 F.

The 24 male and 24 female Ss were randomly divided, respectively, into 3 groups of 8 Ss each: one group of each to take the vitamin compound, another to take placebo and the third group to take nothing. Beginning on Tuesday of the second week of the experiment, and continuing for the next 10 days, vitamin capsules were administered to the male and female vitamin groups and placebo to the male and female placebo groups.

The experiment was presented to the Ss to determine if the daily consumption of a particular multi-vitamin (Vitamin B with C Fortis) would significantly alter the amount of moisture in the skin of the palmar area. The placebo was presented as a second type of multi-vitamin.

On day 10 of the vitamin and placebo consumption period, a final GSRI reading for each of the 48 Ss was recorded. Time of day was considered a variable and so, at each stage, measurements were recorded as close together as possible so that the time interval between the first and last recorded Ss was effectively minimized.

Results

The obtained F ratio of 1.11 for the initial 3 GSRI readings (Table 1) is smaller than 3.22 for p=.05 and therefore the null hypothesis that the k groups are merely random samples from the same normally distributed population can be accepted. (This result indicated that only one final GSRI reading from each S was necessary).

The abnormality of the distribution of scores and the inconclusiveness of an F ratio from an attempted two-Factor analysis of variance necessitated the use of non-parametric statistics for Tables II and III.

The obtained H value of 2.1712 (Table II) for the Kruskal-Wallis Rank Test of Significance was less than 4.605, the value for X^2 for p=.10 and 5.991 for p=.05. The null hypothesis is therefore accepted and it can be concluded that the male Ss came from the same population. Similarly, the null hypothesis that the female Ss came from the same population can be accepted since the obtained H value of 0.72170.211 for p=.90 (Table III).

Discussion

The insignificant results obtained from the Kruskal-Wallis Rank Test of Significance are not in accord with the findings of Hoffer and Green. However, the ten day test period for the present experiment may have been inadequate and the Ss used in this experiment were, presumably, not hyperactive. Further, the 50mg dosage of vitamin B3 contained in the compound can hardly be considered a massive dose since the daily requirements for the normal adult ranges from 12 to 18mg depending on activity. (It must be remembered, however, that the 48 Ss were non-vitamin takers to begin with and the 50mg dosage was most probably in excess of the 12 to 18mg of B3 obtained from normal daily diet)

The placebo used in this experiment was designed to control for suggestion but since there was an insignificant difference between the Vitamin and Control groups, a test for suggestion was not required. However, it is interesting to note that at the conclusion of the experiment reported effects from both placebo and vitamin Ss included "sleepiness, insomnia, unquenchable thirst, enormous appetite and increased vigour."

Summary

This experiment, to determine the effect of multi-vitamin on the stimulation of human Ss as measured by the GSRI, resulted in no significant difference between vitamin and non-vitamin groups. These findings were contrary to what one might have expected in consideration of the Hoffer and Green (1970) experiment.

References

Anderson, A.K. Essentials of Physiological Chemistry, 4th ed. John Wiley & Sons Inc., New York, 1953.

Davis, R.C., Kantor, J.R. Skin Resistance During Hypnotic States, Journal of General Ps. 13, 1935.

Hays, W.L. Statistics For Psychologists, Holt, Rinehart & Winston, New York, 1963.

Hebb, D.O. Textbook of Psychology, W.B. Saunders Co., Toronto, 1972.

Hoffer, Abraham. Health, Chatelaine Magazine, July 1971.

McCleary, R.A. The Nature of the Galvanic Skin Response, Ps. Bull 47, 1950.

Woodworth, R.S., Schlosberg, H. Experimental Psychology, (Rev.) Holt, Rinehart & Winston, New York, 1954.

Table I

Source of Variance	SS	d.f.	MS	F
Between Groups	8885.76	k-1=2	4442.88	1.11
Within Groups	507034.65	k(n-1) =126	4024.08	

At d.f.=2 and n=42, F=2.83 at p=0.05 and F=5.15 at p=0.01. Therefore the hypothesis is accepted.

The Effects Of City-Street-Noise On Persistence And Performance Efficiency On Complex Tasks.

Janice L. Bryan, Gina Tomasino

This paper wishes to investigate one aspect of the multi-dimensional problem we term "pollution." We are interested in the effects of downtown city-street-noise on performance of humans on complex tasks requiring concentration, short-term memory and persistence.

Research into the effects of noise on human performance on complex tasks is divided in its findings: Broadbent found a decline in efficiency on complex tasks under noisy conditions (Samtur 1969). Park and Payne (1968) and Samtur (1969) found no significant difference in performance under noisy conditions. Glass, Friedman and Singer (1969) found that humans do adapt to repeatedly presented aversive noises which results in lowered tolerance for frustration.

We used noise naturally found in the city streets. We suspected that it might operate in a random and intermittent fashion. This type of noise was reported by Sanders (1961) to be more disruptive than constant or fixed intermittent noise. We chose complex tasks since Broadbent had reported them to be more sensitive to disruption by noise (Samtur) and they seemed to parallel the kinds of activity we do take part in while downtown e.g. banking, comparing prices etc. A persistence task was chosen from which we hoped to infer frustration tolerance.

This study seeks to investigate the effects of street-noise, ranging from 61 to 99 decibels, on the performance of 16 undergraduate students on (1) a Finding the Alphabet Test (2) simple calculations (3) a Finding A's Test and (4) a puzzle intended to measure persistence.

Method

The Ss were 16 university students, randomly chosen and randomly assigned to 2 groups of 8. We will call the experimental group, Group A and the control group, Group B.

Street-noise was taped in downtown Montreal. It ranged from 61 to 99 decibels. The noise level was first measured and then reproduced with the help of a sound level meter, using the "A" weighting. This range was then reproduced by a stereo tape recorder. The experiment was housed in a small university classroom. The tape recorder sat on a table placed against the middle of one wall and the 2 speakers were placed, one at each end of the table, facing the desks in which the Ss sat, in 2 rows of 4, one row right behind the other. The first row of desks was 8 feet from the speakers and the second row was 10 feet away The noise level was considered accurately reproduced when measured at a distance of 8 feet from the speakers.

The measures used were: (1) Finding the Alphabet Test, consisting of 5 paragraphs of nonsense words. The S was asked to find the letters of the alphabet in order, once per paragraph, (2) 40 simple calculations (3) Finding "A's" test consisting of 5 paragraphs of prose, in which the S was asked to circle each letter "a" as he came across it in reading the paragraph, (4) An insoluble puzzle drawing, which the S believed to be soluble. Here the S was asked to draw a continuous line which would pass through each line segment of the drawing, but never crossed the same line segment twice.

Group A was tested in the presence of street-noise. We informed the Ss, at the onset, that different amounts of time would be allotted to the tasks: We intentionally allotted too little time to add stress to the situation. The total time of the session under noise was 35 minutes. The Ss were told that the street-noise was about to be turned on to avoid shocking them.

The Alphabet Test was administered; the Ss were given 25 secs. per paragraph. The calculations were then given out and the Ss were given 10 mins.

to complete all 40. The Finding A's test was administered, 35 secs. given per paragraph. Then 20 copies of the puzzle were handed out. The Ss were instructed to solve the puzzle on paper, using as many copies as they wanted but to take a clean copy of the puzzle each time they wished to try a new approach. 10 mins. was allotted to this task. At the end of the session a short questionnaire was given out which enquired about the Ss' ideas of the purpose of the experiment and asked them to rate the effects of the noise on a scale of 1 to 4.

On a separate day a similar session was conducted with Group B but in a no noise situation.

The tests were scored in various ways: the Alphabet Test by counting the number of letters found, correctly in order: From the calculations and the Finding A's test 2 scores were obtained: (1) the number of mistakes and (2) the number completed. In the puzzle the number of copies used by each S became the score i.e. the number of trials.

Results

A t-test for independent samples of unequal size** was used to compare the number correctly completed by Group A and Group B on the Alphabet Test. No significant difference was found (t=1.13; df=13; $p>.05$).

A t-test for independent samples of equal size was used on the calculation test scores to compare (1) the number of mistakes of Group A and Group B. No significant difference was found (t=.86; df=14; $p>.05$). (2) the number not completed by the two groups. A significant difference was found (t=2.94; df=14; $p<.02$).

A t-test for independent samples of equal size was administered to the number completed scores on the Finding A's test. A significant difference was found between the scores of Group A and those of Group B (t=2.48; df=14; $p<.05$). There was no significant difference in the number of mistakes made (t=.45; df=14; $p>.05$).

Another t-test was administered to the number of trials taken by Group A and Group B on the puzzle test. No significant difference was found (t=.61; df=14, $p>.05$).

A Spearman's Rank Order Correlation test was administered to the 2 stes of significant scores i.e. the number not completed on the Finding A's test and the number not completed on the calculations, to see if those Ss who scored poorly on one test also scored poorly on the other and vice versa. A positive correlation was found (r=.78; n=16; $p<.01$).

Our results suggest that street-noise would appear to lower performance efficiency on tests requiring concentration and short-term memory i.e. on the Finding A's and calculation tests. It also appears that those Ss who did poorly on the Finding A's test also did poorly on the calculations.

Street-noise, however, did not seem to effect performance on either the Finding the Alphabet Test also requiring concentration or the puzzle requiring persistence. Street-noise did not significantly effect the number of mistakes made on the tests.

**We had to disregard one S's test because he had obviously misunderstood the instructions.

Discussion

We have some evidence to suggest that street-noise lowers performance efficiency on some tasks requiring concentration and short-term memory but not on others.

Perhaps this is a function of the difficulty of the tests used i.e. as Broadbent suggested (Samtur), or perhaps the Ss were not exposed to street-noise long enough for it to effect performance on the Alphabet Test. Likewise, perhaps longer exposure to street-noise is necessary to effect persistence. To explore these possibilities we could (1) vary the order of presentation of the tests e.g. present the Alphabet Test in the middle of the session, and (2) expose the Ss to street-noise for a longer period before giving a test of persistence.

Further experimentation is indicated to closer approximate the kind of situation in which the city-dweller finds himself vis-à-vis noise i.e. repeatedly exposed to street-noise for varying lengths of time.

References

Glass, D.C., Friedman, L.N., Singer, J.E. Psychi costs of adaptation to an environmental stressor. Journal of Personality and Social Psychology, 1969, Vol. 12 (3), 200-210.

Park, J.F., and Payne, M. Carr. Effects of noise level and difficulty of tasks in performing division. Journal of Applied Psychology, 1963, Vol. 47, 367-8.

Samtur, B.J. The effects of noise on a complex task. Graduate Research in Education and Related Disciplines, 1969, (Spring), Vol. 4 (2), 63-81.

Sanders, A.F. The influence of noise on two discrimination tasks. Ergonomics, Vol. 4, 253-8.

The Effects Of Age On Pain Endurance With And Without Suggestion.

C.A. Beuglet (Mrs.)

This experiment was conducted to see if a negative correlation existed between age and pain endurance and to see if suggestion influenced this endurance time. It also examined the relationship between age and anxiety by measuring the subject on the State Trait Anxiety Inventory (STAI) immediately after the endurance test.

Fifteen subjects male and female, ranging in age from 8 years to 64 years of age participated. A bucket of salted ice water of 0° centigrade was used as the pain stimulus. The STAI, consisting of 40 questions was administered to each subject immediately after the test.

Each subject was tested twice, the first time with the S's preferred hand and fifteen minutes later using his non-preferred hand with the suggestion that the water felt pleasant and comfortable in order to deny the pain. The STAI was then administered to each S without a time limit to determine the amount of anxiety that the S felt due to the pain endurance test. The lower the S's score the less his anxiety.

A summary of the results are shown in the following table.

A significant positive relationship between age and pain endurance was found using the preferred hand and no suggestion on the initial test, the older the S, the longer his endurance time tended to be. These findings disagreed with Collins & Stone (1966) and Sherman et al., but agreed with Schludermann & Zubek (1962). However, on the retest using suggestion to deny pain, and the non-preferred hand, a negative correlation was found, the older the S, the shorter the endurance time.

The endurance times for the younger group of Ss (below 33 years) were almost twice as long using suggestion on the retest to deny the pain than for the endurance times on the first retest with no suggestion. The reverse was found to be true for the group of Ss above 33 years. Their endurance times on the retest, using suggestion, was only half as long as it was on the initial test. They had difficulty denying the pain when retested. This agreed with Mersky (1965) who found that denial of pain was greater with younger Ss. The older Ss appeared more anxious about doing bodily harm on the retest. They commented openly about their concern for arthritis and other possible physical damage. The suggestion appeared to be nullified by their anxiety about bodily harm.

This experiment showed that the major factor related to pain perception seemed to be anxiety. The greater the anxiety, the less pain could be tolerated. The results of the STAI showed that the older Ss had significantly higher A-State scores than the younger Ss. Although no significant difference was found in A-Trait scores between the young and old subjects, the older subjects tended to have higher A-Trait scores. These results indicate that the older subjects showed more anxiety due to the pain test than the younger subjects, and we can assume that this anxiety lessened their pain endurance time on the retest.

The results of this experiment suggest that psychological processes play a powerful role in determining the intensity of pain. Although pain is subjective, it can be modified by suggestion and emotional states of the individual. Its intensity can be influenced by the subject's immediate past experience and by the meaning the subject given to the pain producing situation.

Although the older subjects seemed to endure pain for longer periods of time, they also tended to have a greater potential for anxiety which interferred with their pain tolerance on the retest. This experiment seemed to indicate that anxiety is the major factor in pain perception and the older the subject the more anxious he tends to become about his self preservation.

TABLE SUMMARY OF RESULTS

	N	r	df	t	p(2-tail)	Ho
Relationship bet. age & pain endurance time with no suggestion	15	+.64			p .05	rej
Relationship bet. age & pain endurance time using suggestion	15	-.35			p .05	acc
Diff. bet. Grp. 1 (below 33 yrs) & Grp. 2 (above 33 yrs) in endurance time without suggestion	(1) 7 (2) 8		13	2.67	p .05	rej
Diff. bet. Grp. 1 (below 33 yrs) & Grp. 2 (above 33 yrs) in endurance time with suggestion	(1) 7 (2) 8		13	1.71	p .05	acc
Diff. bet. endurance times with suggestion and without suggestion for Grp. 1 (below 33 yrs)	7		6	-3.15	p .05	rej
Diff. bet. endurance times with suggestion and without suggestion for Grp. 2 (above 33 yrs)	8		7	4.42	p .05	rej
Relationship bet. age & A-State scores	15	+.48			p .05 p .05	acc rej
Diff. bet. A-State & A-Trait scores for Grp. 1 (below 33 yrs)	7		6	1.20	p .05	acc
Diff. bet. A-State & A-Trait scores for Grp. 2 (above 33 yrs)	8		7	3.68	p .05	rej
Diff. bet. Grp. 1 & Grp. 2 in A-State scores	(1) 7 (2) 8			2.37	p .05	rej
Diff. bet. Grp. 1 & Grp. 2 in A-Trait scores	(1) 7 (2) 8		13	1.41	p .05	acc
Relationship bet. A-State & A-Trait scores on the STAI	15	+.52			p .05	rej

Relation Between Fear And Imagery.

S. Mastoras, J. Foley, Luc Dubois

This experiment was conducted to determine whether or not there is a relationship between the vividness of a person's mental imagery and the intensity of their existing fear.

Fear is an emotion characterized by a reaction to danger and because in life people are facing dangerous situations, it is an emotion frequently exerted. Its motivating force is to a certain degree, determined by hereditary factors. However past experience as in personality development, is a crucial factor.

In general, fear is defined as a malady caused by sensing eminent danger. The normal response towards a real or "imagined" menace takes on an exterior expression of the reaction with inner sensations and physiological changes. Great fears cause the subject inner terror leading to palpitations and accelerated heart rythm, tension, trembling, etc.

Phobia a more persistent fear, is an excessive fear towards an object or a situation which is really not a source of danger.

Personal association, a generalization of stimulus, is important in the selection of phobic objects. For someone to overcome fear, it is necessary to perceive the object, a dangerous experience which may easily harm the individual, and the principal factor is for the individual to resist his impulse towards this menace.

Images are the sensorial or perceptual representations to which we are receptive and which exist in the absence of their proper representation. They imply a reaction of the neurophysiological processes which are geared towards the original experience.

There is a transactional relation between the formation of images and emotion:

Emotional State → image formation
imagery ↓ experience
image experiences → emotional state

Thus, an individual with a very vivid imagination should tend to perceive certain situations in such a way that to him they will appear more terrifying than to a person with a less vivid imagination.

Method

Subjects: The subjects were randomly chosen and consisted of 15 males and 15 females of ages varying from 20-35 years old.

Apparatus: The Betts Questionnaire of mental imagery, the Willoughby fear survey schedule containing 122 items which may produce anxiety in the subjects, were used.

Procedures: The experimentors each administered 10 tests to five males and five females. Each subject was given 30 minutes to complete both tests, completing the Bett's first, then the Willoughby. After this, the subjects answered another questionnaire in which they were asked a) whether they would be able to give reasons for most of their fears, b) how honestly they answered c) how vivid they considered their imagination to be d) what they thought was the purpose of the experiment.

The results of all questionnaires were compiled and a Spearman's Rank Order correlation between fear and imagery scores. A t-test was also performed to determine if there was a difference between the degree of fear in males and females.

Results: Having $r \neq o$ with a $p < .05$ we concluded that there is a positive relationship between vividness of imagery and fear intensity; results taken from the Spearman Rank Order correlation. Also the Ho was rejected ($.01<p<.02$) because there was a significant difference between males and females which was characterized by a lesser degree of fear in males than in females where the scoring procedure was higher score, less fear.

Discussion: Upon examining the results it was found that there is a positive correlation between fear and imagination. Since the result was r=98 this correlation was almost a perfect one. This permits us to say that for our 30 subjects, the proposed hypothesis is justified. In the case of the t-test, a significant difference was noted between males and females. That is, the degree of fear is generally lower in males than females. However, it should be stated that this experiment has had many criticisms from the subjects: first, they criticized the complexity of the value scale in the Bett's questionnaire in that they had great difficulty in giving an honest evaluation of the degree of vividness of their imagination.

In the fear survey schedule the subjects found much ambiguity in that each item could be "pushed to its maximum" thus creating greater fear. That is that one item in one situation may be pleasant whereas in another it may be terrifying. Therefore, the subjects had difficulty in answering with complete honesty.

The imagination plays a tremendous role, but the degree of tension in the individual, the intensity of feelings and the degree of complexity were variables that these questionnaires do not take into consideration. We believe that this is the basis of the subjects' criticisms.

This simple experiment on the relationship of imagination and fear does not contain new laws on life but has opened up some questions that may one day be clarified.

RESULTS

SPEARMAN RANK ORDER CORRELATION

R.O. Coeff.	P	d.f.	Ho
98	$.02<p<.05$	28	ReJected

With a therefore, we concluded

$r \neq 0$ a une $p<.05$ et alors nous devons conclure

that there is a positive relationship between vividness

qu'il y a effectivement une relation entre la peur et l'imagination

of imagery and fear intensity.

T-TEST

T-TEST

$\bar{X}_M$	$\bar{X}_F$	$\bar{X}_M - \bar{X}_F$	T-VALUE	d.f.	P.	Ho
484.2	402.9	81.3	4.75	28	$.01<p<.02$	Res.

The Null Hypothesis was rejected because there

L'hypothèse nulle est rejetée parce que à ($.01<p<.02$) on note

was a significant difference between males and

une différence significative entre les mâles et les femelles qui se

females which was characterized by a lesser degree of fear

caractérise par une peur moins fréquente que chez les femmes

in males than in females.

pour ce qui est du mâle

Résultat plus grand = moins de peur

Higher score = less fear.

The Effects Of Downward Shifts Of Reward Upon The Maze Learning And Performance Of Male, Albino Mice.

Richard Clayman

This investigation is concerned with an inquiry into the relationship between magnitude of incentive, and performance and learning. This project, seeking to investigate two main points, firstly explores the connection between magnitude of reward and the level of performance, while secondly, it attempts to discover the effect of variation of magnitude of incentive upon the performance and learning processes. In the past decades, it was believed that the effect of an act largely determined whether or not it would be repeated again on later occasions. Thorndike (1911), created an expression, later labelled the Law of Effect, which stated that the connection between the stimuli and the instrumental responses are strengthened if that connection is followed by a satisfying state of affairs. An important corollary of this law postulates that large rewards produce a stronger connection between stimulus and response, than do small rewards. This assumption was first used to explain why animals learn more quickly when they are offered large, high value rewards. The law explains that if there is a positive effect from this reaction on the organism, then the probability of this reaction increases, while the opposite is true if a negative effect is experienced (Thorndike & Cooke, 1934). Later on, however, in 1942, Leo Crespi conducted an investigation into this occurrence, and his results pointed out an important difference between learning and performance. The magnitude of a reward apparently affected performance, but not learning. Crespi made this fine distinction by having his results show that all of his subjects learned their task equally well, but due to varying rewards, performed at different levels of efficiency. This led to his rejection of Thorndike's Law of Effect as an explanation for learning. On the other, more recent experiments, such as those done by V. Bitterman (1969), have suggested that the Law may be, in effect, more valid than Crespi had shown it to be under certain conditions, not then realized by Thorndike at the time of his work.

The subjects used were sixteen male, albino mice, and out of these sixteen, two main groups of eight were formed. The two main groups were then broken down further, into two additional subgroups, in order to balance them out as to testing times. This was important due to the increased activity displayed by mice at night. So, in essence, four mice from the low value reward group, and four from the high value set were run in the morning, while the others were run at night. The high and low value rewards will be explained later. The task set before the mice was a successful completion, a complete run, of a multiple T-maze, the type first introduced by Elliot (1928). Each trial was considered over when the subject reached the goal box containing the reward, which was located at the end of the final set of "T" passageways. A drawing light was the only source of illumination during each trial run, so as to calm the animal by producing a tranquil, dimly lit atmosphere. Since the rewards had to be based upon magnitude of value, the eight members of the control group was always given ordinary Purina laboratory food chunks, considered to be a low value reward. The experimental group was offered commercial chocolate chip cookies, thought of as having a high value. During this experiment, it was ensured that all mice were running at 85% of their natural weight, while feeding times, though usually only an hour, were sometimes altered to allow to maintain their weight at this level.

Upon receipt of the mice from the Canadian Breeding Farms and Laboratories in Quebec, they were given several days, undistrubed, in holding cages to increase their body weight, as well as to get used to their new surroundings at the same time. The final results were to be tabulated from the mean of wrong turns, from each successive trial, of all the mice in each group, not from the continuing performances of each individual mouse. Each subgroup ran once a day, for sixteen days in a row. The feeding format was on a twenty-three hour deprivation period, with one hour of feeding, that time starting at the end of a completed trial run. At no time were the mice forced to go without water. This trial and food format remained unchanged, except after the tenth trial run. At that time, the high value reward group had their incentive switched to the same low value food that the control group had been getting all along. All though this experiment, the control group retained their same reward. After each feeding hour was over, the twenty-three starvation period was immediately resumed. Maze performance was judged by each group's mean number of wrong turns made in a run, as was noted before. This type of measurement was used, as opposed to keeping time scores, because time suffers from certain disadvantages. Time is much more sensitive to distractions in an experimental situation, than are simple numerical scores. Uncontrolled physical conditions of the animals (i.e. skin irritation) might cause scratching, for example, which will affect time scores. Extraneous stimuli, such as a sudden noise, or a frightening experience in its cage just prior to the run, will prolong any time score. A second consideration in this experiment was simplicity. In investigating motivation in performance, it was very important to minimize the learning factor as much as possible. A maze that was too complex would make the presence of a significant influence of magnitude of incentive, even more difficult to detect, thus decreasing the overall efficiency of the test.

The statistical results were based upon the t-test for significant difference between means of equally-sized samples. First, it was used on the data for the tenth trial, just before the reward change was made, to see if the experimental group was doing significantly better than the control group. At this point, t=2.45 and with 14 df, the probability was less than 0.05. This test was also used in the observation of the last trial, for it was to show if the two groups, now with their positions reversed, now differed significantly. Here, t=2.14, and with 14 df, p was also less than 0.05. This all shows that the high value, experimental group was doing much better in overall performance, than did the low value, control group; until their reward was changed, for after that switch, the experimental group began to perform significantly worse than the control group, who, left unchanged, continued to improve steadily.

There might be a general confusion between the terms "learning" and "performance" already mentioned in this summary. Performance should be taken as being the more general term, since it is the behavior of an animal in a specific situation, while learning is one of the processes which affects the degrees of performance. In this experiment, as in the one done by Maier and Schneirla (1935), the maze performance was being translated into action or behavior. Motivation was just as important because, while learning provides an animal's ability to perform, motivation provides his desire to do so. During the first few trials, the experimental mice showed a sharper decline in mean errors, which meant that they were more willing to work harder for their reward, than were the control mice. These figures indicate that there is a higher level of performance in the high reward group, which would support Thorndike's Law. After the 10th trial, when the high value set was changed to a low reward, this experimental group should have still performed better, because the law states that they should have retained a stronger connection the incentive and the act. When the switch came, the experimental group's progressive performance now found itself reversed, with that same group now making many more errors than it ever had, even though all the mice were still receiving some manner of reward. These results are directly opposite of those predicted by the Law of Effect, and as such, compose rather serious evidence against this general law. It seems entirely plausible that both groups learned the task equally well, but the type or level of incentive affected how well they performed on their task. The downward shift of reward brought about significant "depression" effects. Qualitative observations of the reactions of the mice to this shift in reward, suggests that this depression effect could possibly be caused by some factor of frustration. This "elation-depression" is used to describe a variable trait of mouse behavior which may be compared to the human characteristic of "expectation", and "disappointment". All of these results shown little support for Thorndike's Law, but rather they tend to lean strongly in favour of the more modern anticipatory goal response theory of learning. In this theory of learning, the role of the reward is not to connect the stimulus and the instrumental response, but rather it is to be anticipated, to be learned about. Most tests, associated with this law, done with rats and mice, tend to strongly reject the theory, although Lowes and Bitterman (1967) show the law to hold true for the learning processes in fish, and pigeons (Brownlee & Bitterman, 1968). So, as is already the case, modern contemporary learning theories are based upon work done on the higher animals, although the Law of Effect still has a place in the development of basic learning techniques.

With Isoproterenol, Is Anxiety And Nervousness A Result?

Jean Jarbath, Cornelia Pozezanac, Linda Ivaskiv, Pierre Usereau

Isoproterenol HCl (Isuprel) is the bronchodilator drug used to obtain symptomatic relief of bronchial asthma, emphysema, bronchitis and other chronic bronchopulmonary disorders in which bronchospasm is a complicating factor. It can be administered orally in a form of aerosol or intravenously.

Adverse effects and deaths have been reported resulting from an excessive use of the drug. Tachycardia, palpitation, nervousness, nausea and vomiting may occur due to excessive sympathetic stimulation. Whereas only 4% of patients taking the drug by inhalation exhibited these unfavorable side effects, 33 to 100% of patients using other routes of administration experienced the same effects. (C. Harris, 1972.)

Because of the limited adverse side effects encountered by inhalation, Isoproterenol in aerosol form has become the preferred method of employment. However, the epidemic of asthma deaths in England, Wales and Australia between 1959 and 1956 has been attributed to excessive use of aerosols containing Isoprenaline. (C. Harris, 1972.)

Patients using Isoprel therapeutically often inquire about its properties and specifically about its possible side effects.

The possibility that anxiety has an important role to play in the effects of the drug thus arose.

The purpose of this experiment is to examine the behavior of users of Isoprel on two psychological parameters, nervousness and anxiety, while also measuring effects on their heart rate and blood pressure.

Twenty staff members of the Montreal Chest Hospital were the subjects. The 12 men ranged in age from 22 to 36 ($\bar{X}$=27 yrs.) and the 8 women were between 20 and 40 ($\bar{X}$=28.5 yrs.)

For administering the drug, a standard aerosol-type dispenser (mistometer) was used. It delivered at the mouth-piece an automatically measured dose of (125 mg.) of Isoproterenol HCl in a mist of optimal droplet size for inhalation.

A star pattern startle-response kit connected to a plotter recorder measured nervousness. Blood pressure was taken with a sphygmomanometer and a stop watch was used to record the heart rate. The two part IPAT Self-Analysis questionnaire measured anxiety.

The subjects were taken one at a time and asked to complete one part of the IPAT Self-Analysis questionnaire. Then their heart rate was taken (20 second count) along with their blood pressure. They were then asked to perform the startle response test.

At this point, the drug was administered (two puffs, 250 mgs.), followed by a 10 minute waiting period as this is the time it takes, approximately, for the drug to reach its maximum effect. (Pierson & Grieco, 1969). Heart rate and blood pressure were then again observed. The subjects were asked to perform the startle response test a second time and to complete the other half of the IPAT Self-Analysis Anxiety test.

In presenting the IPAT test, part one and part two were alternated within the sub-groups of: the men below and above their age mean as well as the women above and below the women's age mean. This was to avoid potential bias from age and sex and from the two parts of the test.

The t-test for correlated samples was used to test significance. Only nervousness as measured

by the startle response test was significant (t=2.2380, d.f. = 19, $p < .05$). No significant changes in the Ss' heart rates and systolic and dystolic blood pressures, nor in the degree of anxiety, were obtained.

Heart rate: (t=-.2727, d.f.=19, $p > .10$)

Blood pressure: systolic: (t=.31496, d.f.=19, $p > .10$)

dystolic: (t=.84507, d.f.=19, $p > .10$)

anxiety: (t=.20161, d.f.=19, $p > .10$)

The Ho: that there is no difference between the results before and after receiving the drug Isoproterenol HCl for all observed parameters except nervousness, is therefore accepted.

A reason for obtaining non-significant results may be due to the fact that the Ss, being all medical personnel, were familiar with the properties of the drug. Whereas, the sole measure of significance, i.e. that of the startle response test, may have so resulted due to the mahchine not being sensitive enough.

Suggestions for future research would be to alter the waiting period of ten minutes after the administration of the drug to less than three (3) minutes, as some Ss reported temporary side effects as soon as two (2) minutes after receiving the drug. Also the use of an electrocardiogram may help to measure heart rate more accurately while at the same time providing a continuous record.

Bibliography

Cookson, D., and Reed, C. A Comparison of the Effects of Isoproterenol in the Normal and Asthmatic Subject, American Review of Respiratory Diseases, Vol. 88, Pg. 636, 1963.

Harris, M., Coleman, M.D. Isoproterenol in Chronic Asthmatic Patients Who Do Not Require Hospital Treatment, Annals Allergy, Vol. 30 (6), Pgs. 315-320 incl., 1972.

Herxheimer, H. Asthma Deaths: A Question Answered, British Medical Journal, Vol. 4: 795, Dec. 30, 1972.

Pierson, R.N., and Grieco, M.H. Isoproterenol Aerosol in Normal and Asthmatic Subjects, American Review of Respiratory Diseases, Vol. 100, Pg. 533, 1969.

Stress And Achievement.

Jeffrey Freder, Claire Lightstone, Sue-Anne Levine, Karen Flam

It was the purpose of this experiment to assess whether a stressful school environment, as well as parental pressure, had any effect on 7th grade, 12- and 13-year-old students' scholastic achievements. It was felt that standardized tests in conjunction with a personalized questionnaire would reveal data on which to base our conclusions. Previous research on stress and anxiety have presented us with the foundations for this research.

Weitz (1970) states that "in general a situation presumably becomes stressful if the inputs are numerous enough to prohibit adequate information processing and the organism becomes overloaded." Similarly Torrence (1966) states that "breakdown of some type may be expected to occur if there are discrepancies between abilities and goals." Selye (1956) on the other hand, views stress as "a state of the organism that underlies both its adaptive and maladaptive reactions." The experimentation of Pavlov, Liddell and Gantt has demonstrated that adaptation fails when the requirements of the situation are more than the organism can cope with.

Our basic premise is that the stress school students would show a decrement in achievement as compared to the non-stress school students. The stress factor involved was the hours per week of required work time. School A had 28 hours 30 minutes as compared to School B's 18 hours and 45 minutes per week's required work time. Eighty subjects were tested, forty from each school.

It was found that after administering sections of the Metropolitan Achievement Test that there was no significant difference between the two schools' achievement levels.

Table: t-test for independent samples of unequal size

Test	School A	School B					
	$\bar{X}$	$\bar{X}$	$\bar{X}$ diff.	t	df	P	Ho
Metropolitan							
Word Knowledge	38.40	33.16	5.24	.597	76	$>.05$	not reject
Reading	32.43	29.32	3.46	.46	76	$>.05$	not reject
Spelling	45.26	35.06	10.19	1.028	76	$>.05$	not reject
Math	28.51	18.65	9.86	1.59	76	$>.05$	not reject

It was also found that when performing a Spearman Rank Correlation to test the relationship between I.Q. and Achievement level, a rank difference correlation coefficient of .01 for School A and .09 for School B led us to conclude that there was no correlation between I.Q. and Achievement, and that I.Q. and Achievement are independent of each other.

Chi Square Analysis was performed to evaluate the results of the questionnaire administered to assess parental and school pressure. No significant findings were exposed by this analysis. However, a table of the percentage comparisons between School A and School B did indicate a greater subjective feeling of stress in School A.

This study has shown statistically that there is no difference between stress School A and non-stress School B, and it is felt that it has been shown that there is no decrement in achievement due to the stress of learning great amounts of material in a regular school day. This conclusion leaves us with the question at to whether this is due to "coping", "motivation", of other "adaptive" syndromes. The next question we are left with is whether learning in this kind of learning situation is in fact stressful. Is the amount of learning time imposed on the students of School A the correct amount for better learning? We have also found that neither home stress nor school stress, as shown by replies to the questionnaire, have any relation to achievement. There is no doubt that further research is necessary in this area since we may well find that rather than easing the learning situation, which is the trend in schools today, we should increase our expectations of students, but at the same also increase the personal contact between teachers, principals and students. It may also be profitable to concentrate on the positive achievements of students rather than their negative achievements.

The results of this research have only multiplied the questions. It would be hoped that this research may be replicated in the future, and at that time, possibly find some answers to our questions.

(Table 1)

SCHOOL DESCRIPTION = WORK TIME AND FREE TIME (See appendix 1-2)

	School A	School B
Total School Time	6 hrs. 45 min. per day 33 hrs. 45 min. per week	6 hrs. 40 min. per day 33 hrs. 40 min. per week
Work Time	28 hrs. 30 min. per week	18 hrs. 40 min. per week
Lunch Time	35 min. per day (of which 25 min. may be used for library work or recreation) 2 hrs. 55 min. per week	40 min. per day 3 hrs. 15 min. per week
Recess	10 min. per day 50 min. per week	no special recess-5 min. between each class.
Study Periods	none	Possible 5 free periods per week. Can be used any way student wishes. 3 hrs. 20 min. per week.
Required Courses	French 5 periods Lang. Arts (English) 4 periods Math 5 periods Science 3 periods	French 8 periods English 4 periods Math 3 periods Biology 4 periods

---

SCHOOL DESCRIPTION = WORK TIME AND FREE TIME (Cont'd)

School A		School B	
Required Courses			
Soc. Science (History)	3 periods	History	3 periods
Tanach (Bible)	4 periods	Geography	2 periods
Hebrew Lit. (in Hebrew)	4 periods		
Yiddish	4 periods		
Jewish Hist	2 periods		
Required Jewish Studies	2 periods	Art (or other subject)	2 periods
Electives			26 periods
Art Typing Lit. de Quebec	2 periods		
	38 periods		
Gym	2 periods	Gym	2 periods
Electives	none	3 periods per week obligated 2 periods per week (Friday) child may go home.	

A Study Of Retroactive Inhibition.

Gord Barnard, Allan Johnson, Murry Morrison

This experiment was performed in order to test the validity of some theories regarding retroactive inhibition in verbal learning.

McGeoch felt that the interference of new material was the most important cause of loss of retention of previously-learned data. Experimental support was later found for a two-factor theory of forgetting due to retroactive inhibition. The first factor is a competition between old responses and new responses, from the initial learning and the interpolated learning respectively. The second factor is a weakening of the initially-learned material due to non-reinforcement during the period when the interpolated material is being learned.

In accordance with these findings, we would expect to see less forgetting in a control group not exposed to a second set of data, than in a group to which new material was introduced between recall periods of the initially-learned data.

It has also been found that the degree of retroactive inhibition varies directly with the similarity between original and interpolated material. It has been proposed that the memory utilizes a selector mechanism, which allows it to differentiate between categories of data. On this basis, we would expect to see more retroactive inhibition in a group learning two lists of CVC's (consonant-vowel-consonant-nonsense syllables), than in a group learning a list of CVC's followed by a list of English words.

Three lists were used in this experiment. Lists A and B were composed of 10 CVC's each, while list C contained 10 English words. Thirty volunteers were tested, ten being assigned to each of the following groups:

Control	Experimental I	Experimental II
Learn A (2 min).	Learn A (2 min).	Learn A (2 min).
Recall A (1 min).	Recall A (1 min).	Recall A (1 min).
Rest (3 min).	Learn B (2 min).	Learn C (2 min).
	Recall B (1 min).	Recall C (1 min).
Recall A (1 min).	Recall A (1 min).	Recall A (1 min).

The results showed significantly more RI under experimental condition I than under experimental condition II (+=5.14, d.f.=18, p < ,05), and more RI in the latter than in the control group (+=2.18, d.f.=18, p < .05). Thus, there is also significantly more RI in experimental condition I than in the control group.

There was more forgetting under experimental condition I when the stimuli were the same (CVC's) than under experimental condition II, when they were very different (CVC's and English words). In this case, the theory of similar stimuli is supported.

Because both experimental conditions showed a greater degree of RI than did the control group, the two-factor theory, of competition between responses and non-reinforcement of data during a second learning session, is supported. In fact, there was a larger difference between experimental condition I and experimental condition II, than between experimental condition II and the control group, showing categorically similar stimuli to be the main cause of forgetting in this case.

In conclusion, retroactive inhibition is more prevalent when learned material is identical in form than when original and interpolated material are relatively dissimilar. Further, it seems from our results that the type of interpolated data causing

retroactive inhibition can be a more important part of forgetting than the fact that this data is introduced.

The Effect Of Suggestibility On The Performance Of Introverted And Extroverted Children In An Arithmetic Test.

Jean P. Currie, Karin Kirchlof, Dawn Luke, Jean Pierre Talarmin

It has been postulated that individuals with high levels and speed of reactive and cortical inhibition are predisposed to extroversion, whereas individuals in whom reactive cortical inhibition is weak and generated slowly are predisposed to introversion (Eysenck, 1955) Eysenck's hypothesis was confirmed by his own experiments with the figural after-effect. Various tests have also been done in the general area of suggestibility in children (Messerschmidt, 1933, McConnell, 1963). McConnell (1963) and Eysenck (1955) used measures of suggestibility (among other measures) prior to actual tests to distinguish extroverts from introverts. However, there do not seem to be any attempts made to relate suggestibility and its effect on performance to the personality traits in question.

The present study was therefore designed to investigate the effect of three conditions-no suggestion, positive suggestion, and negative suggestion-on the performance of fifth grade children in an arithmetic test. On the basis of experiments by Eysenck and others, it was hypothesized that extroverts and introverts would be differentially suggestible. **Hence, while all Ss were expected to obtain lower scores under conditions of negative suggestion and higher scores with positive suggestion, it was anticipated that these differences would be greater for introverts.**

Method

Subjects. The Ss (n=71) consisted of three unstreamed classes of children at the grade five level from similar socio-economic backgrounds. The median age was 11 years 2 months.

Material. Two tests were given. Firstly, the Concordia Mathematic Test (1974), designed to

measure mathematical skills pertaining to the grade V program. Secondly, the Junior Eysenck Personality Inventory Test (1965) was used to measure extroversion.

Procedures. Class I was given the Math Test without comment, and instructed to fill in the answers. Class II was told that the test was very easy and that each person would do well. Class III was told that the test was extremely difficult and that no one had ever been known to pass it. One point was scored for each correct answer. Precautions were taken during the testing period so that there would be no interaction between the groups possible. The E.P.I. test was presented to all Ss without specific explanation as to what the test was all about. Simultaneously, assurance was given to keep the test absolutely confidential.

Results

A 1-way analysis of variance was used to evaluate the effects of suggestion and lack of suggestion on the performance of the subjects in general. A significant difference was found between the performance of the control group (no suggestion) and the group which was given positive suggestion ($\alpha = .05$, Critical $F = 6.28$, $p < .01$), but differences between the control and negative suggestion groups proved to be non-significant ($\alpha = .05$, Critical $F = 6.28$, $p > .05$) as were differences between the two conditions of suggestion ($\alpha = .05$, Critical $F = 6.28$, $p > .05$)

To distinguish between extroverts and introverts, extroversion was determined as a score of 20 or above on the extroversion scale of the Junior E.P.I. test and introversion as a score of 19 or less (based on the median score of 19.76 and $\bar{X}_e = 19.59$).

The distribution of test scores for both extroverts and introverts was negatively skewed under the condition of positive suggestion and was also negatively skewed for extroverts under the condition of negative suggestion. In view of this and the wide range of variance between conditions (from 9.20 to 60.99), a nonparametric test, the median test, was used to determine if diferences between extroverts and introverts were significant under any of the three conditions. However, calculation by the Median test did not produce any significant differences (= .05, d.f. = 1).

To determine if extroversion-introversion differentially affected performance under the three conditions, the Kruskal-Wallis H test was applied. It was found that while introverts obtained significantly higher scores under conditions of positive suggestion versus no suggestion (d.f. = 2, $\alpha = .05$, 2-tailed, $p < .05$), their performance was not significantly worse under conditions of negative suggestion versus no suggestion. On the other hand, extroverts performed significantly better under conditions of negative suggestion (d.f. = 2, $\alpha = .05$, 2-tailed, $p < .05$, but comparisons of positive versus negative suggestion versus no suggestion did not reveal significant difference.

Discussion

Contrary to expectations, Ss overall obtained their lowest scores under the condition of no suggestion rather than under the condition of negative suggestion. The possibility exists that Ss under the latter condition considered the test a challenge. The control group consequently scored lower since their level of aspiration was probably not influenced at all.

In addition, the predicted interrelationship of introversion-extroversion under conditions of positive and negative suggestion were observed from the results to be in direction rather than degree. The performance of extroverts improved under both conditions of suggestion with the highest scores obtained under the condition of negative suggestion. Here again the situation arises whether or not extroverts considered the test a challenge. In case they did, challenge could be assumed to induce a greater amount of cortical activity, a state of arousal, and a simultaneous reduction in reactive cortical inhibition, as supported by Milner's research on cortical activity (Peter M. Milner, 1970). Given interpretation would thus be in accordance with Eysenck's theory on extroversion (Eysenck, 1955).

Introverts tended to react in the direction predicted. They improved markedly under condition of positive suggestion, though not as much as the extroverts, but performed significantly poorer under the condition of negative suggestion. Under the condition of no suggestion, introverts as well as extroverts did exhibit a moderate level of performance. Introverts scored slightly higher so than extroverts.

In summary one may say that the performance of introverted children seems to be influenced by negative or positive suggestion. In respect to extroverts, the condition of positive suggestion also exerts an influence on performance. Negative suggestion, increasing performance to an even greater degree might either mean that demand characteristics had not been properly met or is in contradiction to Eysenck's theory. To clarify latter point, a better controlled and more extensive study, including measures on motivation, competitiveness as well as extroversion-introversion should be carried out.

List Of References

Bryan, J.F., and Locke, E.A. Goal setting as a means of increasing motivation. Journal of Applied Psychology, 1967, 51, 2740277.

Eysenck, H.J. Cortical Inhibition, Figural After Effect and Theory of Personality. Jorn. of Abn. and Soc. Psych., 1955, Vol. 51, 94-97.

Frank's, C.M. Conditioning and Personality: A Study of Normal and Neurotic Subjects. Journ. of Abn. Soc. Psychl., Vol. 52, 1956.

Gustafson, A., Lawrence & Orne T. Martin. Effects of Perceived Role and Role Success on the Detection of Deception. Journ. of Appl. Psych., 1965, Vol. 49, No. 6.

Kimble, A., Gregory. Environmental Variables: Principles of General Psychology. 3rd edition. New York: The Ronald Press Company, 1968.

McConnell, R. Thomas, Jr. Suggestibility in Children as a Function of Chronological Age. Journ. of Abn. and Soc. Psych., 1963, Vol. 67, No. 3.

Milner, M. Peter. Alerting Mechanism: Physiological Psychology. New York: Holt, Rinehart and Winston, Inc., 1970.

Munn, L. Norman. Foundations of Learning. 5th edition. New York: Houghton Mifflin Comp., 1966.

The Effects Of Adrenaline On Electric Shock Tolerance In Rats.

Alex Zimakas

In the past, the common experience known as pain has been defined and explained in many differing ways. Of late, many of these explanations seem to be offering theories of a complex interplay of physiological and psychological factors rather than the more simplistic previous concept of stimulus-pain receptor theories. Melzac (1961) in his article "The Perception of Pain", states that pain perception is modified by our past experiences, our expectations and by our culture. Zborowski reported findings of ethnic differences in pain tolerance. Beecher (1959) measured subjective responses to pain by soldiers injured during battle and compared them to responses in similar civilian injuries, reporting considerable differences in the degree and quality of pain perceived. Other studies by Melzac and Thompson indicate that early sensory deprivation in dogs altered and affected their perception of pain as compared to dogs reared in a normal environment.

Thus we have an experience, physiological pain, perceived subjectively depending on factors such as expectations, past experiences, etc. These factors in turn, when related to pain, can be closely associated with emotional states such as fear, anxiety and stress. Hall and Stride (in Melzack, 1961) found that the simple appearance of the word "pain" in a set of instructions made anxious subjects report as painful a level of shock they did not regard as painful when the word was absent from the instructions. Conversely, other experiments have shown that if anxiety is dispelled, a given level of electric shock is significantly less painful than the same stimulus under conditions of high anxiety.

Many of the physiological characteristics involved in these emotional states of anxiety and fear have been linked with synthesis and metabolism.

Moran, Gary et al report significantly more emotionality in adrenaline-injected rats. If then, we accept the explanation of pain as a sensory perception modified by a system of nerve fibers emanating from the higher areas of the brain (Melzack, 1961) where the psychological processes of memory and emotions take place, can we assume that a precursor of this modifying element is adrenaline, its components or effects?

In this experiment, an attempt will be made to investigate whether or not there is a relationship between adrenaline and electric shock (pain) tolerance in rats.

Method

Subjects. The subjects were 12 male Wistar rats, each weighing between 210 and 230 gms.

Apparatus. The apparatus used was a scale to weigh the rats, hypodermic needles to administer two levels of adrenaline (.05 cc/kg and .5 cc/kg) and a Ringer solution. The test chamber was an electrically wired (floor bars) Skinner Box, with labelled electric shock intervals of .50 ma.

Procedure. Each subject, serving as his own control, was tested under four conditions: normal (no injection); Ringer solution injection (equal volume as adrenaline); .05 cc/kg of adrenaline; and .5 cc/kg of adrenaline. Trials were run in a random fashion, (one subject first at the .05 level, one first at the normal, another first at the .5 level, etc.) with at least 24 hours interval between trials for the same animal. Subjects were injected intraperitoneally, rested for 10 minutes and then tested. Once placed in the test chamber, shock was administered at regularly spaced .25 ma step intervals. Tabulation of shock levels was made when subjects reacted by flinch (pronounced shuddering, lifting of single paw), jump (escape exertion, lifting of two paws simultaneously), and vocalization (continued squealing). For each subject under each drug condition three runs were made and an average obtained.

Results

T-tests for paired observations were computed between the different drug conditions for each of the reactions (flinch, jump, and vocalization) and appear in summary form in the table below:

SUMMARY OF T-TESTS FOR PAIRED OBSERVATIONS (REACTIONS VS DRUG LEVELS)

	Ringer & .05 adrenaline			Ringer & .5 adrenaline			.05 & .5 adrenaline		
Calculation	flinch	jump	voc	flin	jump	voc	flin	jump	vocal
Mean Difference	54.8	50.0	47.3	30.6	30.6	32.0	24.3	19.4	15.3
T-Value	2.31	2.31	2.18	1.16	1.32	1.39	1.06	.89	.72
Degrees of Freedom	11	11	11	11	11	11	11	11	11
Probability	.05	.05	.05	.05	.05	.05	.05	.05	.05
Null Hypothesis	rej	rej	rej	acc	acc	acc	acc	acc	accept

The differences in results obtained between the Ringer solution and .5 adrenaline level, and also between the .05 and .5 adrenaline levels did not indicate significance at the .05 level for any of the reactions. Therefore we must assume that any differences in the mean scores obtained were due to sampling variations and subsequently accept the H_o of no significant difference and maintain that the two samples involved could have come from populations with different means.

A repeated measures, randomized block design analysis of variance was computed to evaluate the effects of the varying drug levles on electric shock tolerance as indicated by the flinch reaction. Groups of three subjects were assigned to each block based on the random order of testing, an average score was obtained and noted in the appropriate block row. The obtained F value of 1.1 at 3/9 d.f. indicated no significant (p>.05) effects of the drug conditions on shock tolerance.

The somewhat contradictory results of the two different tests (minor significance in the t-test, no significance in the variance analysis) could be ascribed to the additive nature of conducting multiple t-tests which tends to increase the probability of significance.

Discussion

In an attempt to arrive at a more fundamental and clear-cut physiological explanation of the subjectivity of pain perception as influenced by psychological factors, this experiment tried to investigate if a relationship exists between pain tolerance (defined as electric shock) and the level of adrenaline. Wistar rats were injected with a placebo and two adrenaline dosages and were then subjected to electric shock. Flinch, jump and vocalization reactions were measured under the various drug conditions and then compared.

The implied experimental hypothesis, that tolerance would decrease with an increase in adrenaline level, did not fare so well. T-tests for means of related samples failed to yield significance (p>.05) between the Ringer solution and .5 adrenaline levels and also between the .05 and .5 adrenaline levels. Significance (p<.05) in the desired direction was obtained between the Ringer solution and .05 adrenaline dosage. A repeated measures, randomized block design analysis of variance for flinch reaction between the four drug conditions failed to yield significant results.

Reasons for significance at the .05 adrenaline dosage and not at the .5 dosage level could be offered in physiological explanations such as compensatory reflex adjustments by the body to the higher adrenaline level and differing metabolic and synthesizing rates. Further support is offered by experiments conducted by J. Gibbs et al which show that adrenalectomized rats had higher thresholds for flinch and jump behaviour than weight matched controls.

In spite of a faint evidence of significance, I did not feel very convinced of any positive results in support of the experimental hypothesis. Some of the stumbling blocks encountered were: the "freeze" reaction displayed by some of the animals, when no amount of shock would elicit any reaction from them; the somewhat subjective definition of flinch, jump and vocalization reactions, which did not afford for clear-cut, undisputed measurements; and the tendency of the experimenter to succumb to demand characteristics. Of positive value was the realization of the many complex and varying factors involved in trying to design a manipulative experiment at a fundamental level.

References

Melzack, Ronald. Perception of pain. *Scientific American*, 1961.

Beecher, K. Henry. Measurement of subjective responses. Oxford University Press, 1959.

Turner, C. Donnel. General endocrinology. W.B. Saunders Company, 1966.

Moran; Gary; Ahmad & Meagher. Adrenaline and avoidance learning. *Journal of Experimental Research and Personality*, *Vol 4, (2)*, 84-89.

Gibbs, J., et al. Behavioural responsiveness of adrenalectomized, hypophysectomized and intact rats to electric shock. *Journal of Physiological Psychology*, Vol 82, *(1)*, 165-169, Jan. 1973.

A Study Of Equivalence Formation Of Drawings In Children.

P. Elbaz, M. Emmett, M. McKeouin

An experiment was designed to test whether there was a significant difference between 5-6 year olds and 8-9 year olds in their method of classifying drawings by common qualities and if a transformation in concept operations followed a cognitive organization from a perceptual classification to a nominal and functional one.

The study pointed out that previous research by J. Piaget has shown that children from 2 to 7 years of age are perceptually guided in their adaptation to sensory-motor experience. Not until 7-11 years do children usually acquire the mental operations of decentration and reversibility through the exercise of mental imagery, enabling less susceptibility to perceptual variations among objects. J. Bruner has found that as language structure develops, there are fewer perceptual references when grouping objects represented pictorially or verbally and more functional and nominal equivalences among objects. While using pictorial symbols for objects, Hornsby observed that equivalence classification progressed from perceptual associations to functional ones with the increase of age from 6 years to 8 years. Davidon examined the level of abstraction of the material used in equivalence formations and found perceptual explanations are facilitated when grouping pictures, while nominal and functional categories have a closer affinity with word categorization.

A random sample of elementary school students from the Jewish People's School in Montreal was taken, consisting of both males and females. 155 attended a kindergarten class and ranged in age from 5 years to 6 years 4 months, 175 ranged in age from 8 years to 9 years 5 months, and were from the third grade. Three experimenters tested from 5 to 65 children from each of the two age categories.

The experimental apparatus consisted of three identical sets of 41 drawings pasted on individual three inch square cardboard, depicting objects in the environment familiar to children, such as food items, animals, clothing, household articles. The items in the drawings were of relative similarity in detail of color, and abstraction. The objects that were represented by the sketches could be sorted into more than pair groupings. Score sheets wereused to transcribe the Ss age, classification of the drawings and individual explanations for the classifications.

3Ss were tested at each session, held in the unoccupied library of the Jewish People's School. Each experimenter displayed his copy of the 41 drawings on a table separated from the other two experimenters' allowing for privacy and prohibiting collaboration among Ss. A standardized statement of the instructions was given, in which each S was told to choose any number of drawings which he thought belonged together for a particular reason. Following the grouping of pictures, the reasons for including the drawings in each group was recorded verbatim.

The Ss classification of the drawings were judged as perceptual if the S indicated the items were alike on the basis of quality such as color, chape, size, and position in time and space. Evidence of functional groupings were accounted for when Ss stated what the objects could do that was common to all of them or what similar action could be performed with all the objects.

The results were based on the first five groupings. The results supported the hypothesis that children at the age of 5-6 years equal drawings with perceptual responses more frequently than 8-9 year olds and functional responses occur less frequently at the age of 5-6 than from 8-9 year olds.

By using the Ho of no-difference between the number of perceptual responses by 5-6 year olds and 8-9 year olds, the Mann-Whitney U Test was significant at alpha=.05 (U=27.5, df=15, 17, 2 tailed p<.002). The Ho of no-difference was assumed between the functional responses of 5-6 year olds and 8-9 year olds, the Mann-Whitney U Test was significant at alpha=.05 (U=69, df=15, 17, 2 tailed p<.05). Chi Square was significant at alpha=.05 ($X^2=36.03$, df=2, p<.001) which rejected the Ho of no relationship between the ages of the S and their perceptual or functional equaling performance.

The results provided are tentative since with a retest situation the results may show that individual children equal drawings differently. Furthermore, only by changing the testing material can the results be attributed to the children's stage of concept formation and not to the particular effect of the experimental material. In conclusion, studies in the area of equivalence formation fall short of unifying the methodology used in presenting the experimental materials, as studies have presented pictures that range from austere line outlines of objects to colorful three dimensional representations and word arrays that vary in disparity within each word set and in degree of abstraction among word lists, creating difficulty in comparing results among researchers.

Experimental Aesthetics.

Kevin Sheridan, Wanda Iacurto

Essentially this lab was a study in experimental aesthetics but more specifically it dealt with the ancient theory of the GOLDEN SECTION-it best presented "unity in diversity" and therefore, possessed the ideal proportion. In order for a figure (in this experiment rectangles were used exclusively) to conform with the concept of the golden section, the width must be .618 of the length. Simply stated then, according to the theory, any rectangle with those specific dimensions would be judged the "most pleasing" figure by a majority of individuals. It should be made clear that this is not an examination of beauty as such but rather a study of the individual's concept of beauty, the variety of attitudes and tendencies of agreement. Basically, the purpose of this lab was to examine the theory and to determine whether or not the choices for the most pleasing figure differred significantly between Fine Arts Students. Engineering students and a random sampling of students as well as male and female students.

Method

Subjects: Sixty subjects were tested, twenty of which were Fine Arts S's, twenty were Engineering S's and twenty S's were selected at random. Thirty S's were male and thirty female.

Materials: A questionnaire containing nine ready-made rectangles was given to each S to complete as per instructions. The proportions of each rectangle varied so that there were separate and distinct figures. The proportions were constructed so that the width was a certain fraction of the length. The ratios were 1.00 (perfect square of 2 centimeters), .90, .80, .75, .70, .618 *(golden section), .57, .45, .30.

Procedure: Each S was given a questionnaire and instructed to choose one rectangle "most pleasing to look at" and also one that was the least pleasing. The S's were then instructed to rank all the figures on a descending scale of preference - the most pleasing being the highest and the least pleasing the lowest. The results were then tested in two different ways. First, an over-all analysis of the raw data was performed using the number and percentage of votes cast for both the best and worst choices. This was done in order to determine if any significant preferences occurred among the different sample groups. Next, only the first three choices for the most pleasing rectangle were used. Rectangle with ratio .618 was given a high score of 6, the closest ratio of .57 was assigned a score of 5 and the next closest ratio of .70 was assigned a score of 3. Since only the first three choices were considered a score of 14 would indicate a strong preference along the lines of the golden section while a score of 0 would indicate no preferences at all (at least in relation to this theory).

Results

The X^2 scores for Best Rectangle: Fine Arts $X^2 = 10.84$ $p > .05$ H_o is accepted, Engineering $X^2 = 6.30$ $p > .05$ H_o accepted, Rand. Sam. $X^2 = 11.92$ $p > .05$ H_o accepted, Males $X^2 = 11.87$ p .05 H_o accepted, Females $X^2 = 15.73$ $p < .05$ H_o rejected and Total S's $X^2 = 18.91$ $p < .05$ H_o is rejected.

In the first four categories of S's there occurred no significant relationship in the selection of the most pleasing figure. However, both the female S's and the total number of S's did in fact display certain preferences in selection. There was in fact a tendency to vote for both the perfect square (ratio 1.00) and the golden section (ratio .618) thus, demonstrating two distinct modes of preference. (Because of the design of this experiment it was impossible to state with any degree of certainty whether or not there occurred a significant relationship between the two most pleasing figures).

The X^2 scores for the Worst Rectangle: Fine Arts $X^2 = 21.93$ $p<.01$ Ho is rejected, Engineering $X^2 = 38.77$ $p<.01$ Ho rejected, Rand. Samp. $X^2 = 27.06$ $p<.01$ Ho rejected, Males $X^2 = 46.63$ $p<.01$ Ho rejected, Females $X^2 = 30.67$ $p<.01$ Ho rejected and total S's $X^2 = 75.61$ $p<.01$ Ho is rejected. Since in each and every instance the Ho was rejected it was concluded that there were very distinct preferences expressed in the choosing of the least appealing figure. This conclusion can be fully appreciated when one considers that 66.9% of the total number of votes chose the two extremes - the perfect square and the slenderest rectangle - as the worst of the lot.

Using the first three choices for Best Rectangle and by assigning the appropriate scores according to the scoring criteria outlined previously, several t-tests for independent samples were conducted. As the tests pointed out the choices of the males did not differ significantly from those made by the females. Also, there were no significant differences between any one group (Fine Arts, Engineering and Random Sample) and another.

Discussion

The selection of the least pleasing figure demonstrated very definite preferences. Fully two-thirds of all the subjects tested indicated displeasure with the two figures representing the two extremes. At the same time those figures in the area of the golden section received very little as being the worst rectangle.

Contrary to what was originally believed no one group of S's held an advantage over another in selecting the most pleasing figure. These results can be interpreted in any number of ways but the question comes down to two main points; either the golden section does not possess the ideal proportions or else no one group was sufficiently trained in recognizing pleasingness as defined by the golden section.

The raw data clearly shows that the ideal rectangle received the most number of votes (14 or 23.4%) but that number was neither overwhelming nor representative of a majority. Due to the fact that there is such a wide range of choices expressed by all the subjects, this only serves to deflate the theory of the golden section rather than support it.

References

Davis, F.C. American Journal of Psychology 45, 1933.

Martin, L.J. Style and Vision in Art. "The Listner" Boston, April 1957.

Neinstedt, C.W. Journal of Genetic Psychology 78, 1951.
Ross, S.

Valentine, C.W. The Experimental Psychology of Beauty. The Camelot Press Ltd., London & Southampton, 1962.

Weber, C.O. The Aesthetics of Rectangles. Journal of Applied Psychology 15, 1931.

Woodworth, R.S. Experimental Psychology. Henry Holt & Co. Ltd., New York, 1938.

Overcrowding And Aggressive Behavior In Grade Five Boys.

Mireille Steinberg, Ida Pencer

This study compared and evaluated two groups of latency age boys, one from an overcrowded school, and the other from a normally populated school, on a measure of control over impulsive aggression. The boys in the overcrowded school were found to be significantly more aggressive than the children in the control group.

Introduction

Scores of experiments in the field of environmental psychology provide interesting arguments, which are both convincing and contradictory, about the effects of overcrowding on man's behavior. Briefly stated, the focus of contraversy revolves around the delterious effects of overcrowding on our social order versus man's remarkable ability to adapt to his ever-changing environment.

Against this background, we theorized that, unlike adults who have erected a sophisticated system of values, rationalizations and personal resources with which to meet and transcend challenges, children are more likely to react impulsively and directly when confronted with frustrating situations and obstacles to their freedom of action (such as overcrowding may present). Indeed, in Proshansky, Ittelson and Rivlin's words, overcrowding is an encroachment on the individual's "freedom of choice", and thus on his "human dignity and qualities."

We set out to test two elementary schools. School A, our experimental school, suffered from serious and endemic vandalism inflicted by its own student population and from a severe overcrowded situation, housing roughly one-third to one-half more pupils than it was designed to accommodate. All facilities in School A were inadequate and overburdened. The administration of School A also headed another school, School B, our control group, in a neighbouring area. School B, while filled to capacity was not (yet) considered overcrowded. However, owing to the single administration, we were provided with important built-in controls, such as adherence to the same general pedagogical principles, and disciplinary practices. Furthermore, the population of the two schools were of the same ethnic background and of comparable socio-economic milieus, (generally middle-class). Our two groups consisted of grade five boys whom we tested on a dimension of aggressive impulsivity as measured by the "Instrument for Classifying Impulse Control among boys" (or ICCI) devised by John Matsushima. Our level of probability was set at 5% (.05), the standard probability level for most psychology experiments. We also opted for the two-tailed test as our results could conceivably have reversed the two-tailed test as our results could conceivably have reversed our prediction, and also because this test is somewhat more stringent.

Our prediction, of course, was that subjects in group A would have significantly less control over their aggressive impulses than subjects in group B.

Method

Subjects: The subjects consisted of 18 boys from School A and 12 boys from School B, all at the grade five level. Boys only were tested because the ICCI was devised for boys only of grades 4,5, or 6.

Materials: The test we used, Matsushima's ICCI (or Instrument for Classifying Impulse Control among boys) was designed "to classify normal, latency-age boys as high or low in control of aggressive impulsivity. The test was found to have an odd-even reliability of .93, and validation tests were significant beyond the .01 level. No more than 20 minutes are necessary to complete the test.

Procedure: The boys were tested following standardized instructions accompanying the test. Each sentence was scored 1,2,3, or 4 points "depending on indicated tendency to immediacy of aggressive action." All scores of 50 or lower included subjects with high control (Hi-C) over aggressive action, while scores of 70 or higher included low-control (Lo-C) subjects. Of course, no subject could score lower than 23 or higher than 92. (We deleted item six as per author's suggestion).

After testing, the two groups were individually scored on separate sheets of paper by each of the two experimenters. All calculations were also carried out independently, and then compared. This was done as an added control against human error.

Results

To analyze our results, we submitted our data to a t-test for independent samples of unequal size. As already stated we had set an alpha level of .05 on a two-tailed test.

Our results yield a significant difference between our two groups in the predicted direction at beyond the .05 level. t=2.27, d.f. = 28, $p < .05$ ($\bar{X}_A=64.67$; $\bar{X}_B=56.25$). It is interesting to note here that while group A had five subjects in the Lo-C (highly aggressive) category, or about 28% of their population, in group B no score exceeded 69. On the other hand, while group B contributed two subjects to the Hi-C category (or 17%), only one subject obtained a score of 50 in group A (or 5%). The bulk of the populations for each of the two groups scored somewhere between 51 and 69 (or about 67% for group A, and 83% for group B).

Discussion

Our findings lend support to the literature in the field which suggests that an adverse physical environment does indeed affect behavior. Although we cannot pretend to have established, on the basis of our single study, a definitive and direct causal relationship, our research indicates that overcrowding may have a significant influence on aggressive behavior in school children. It would have been interesting, for comparative purposes, to test children from other school systems with varying degrees of overcrowding, as well as from different socio-economic backgrounds. It would also have been useful to test other grades in our two schools (such as four and six) to see if the results could have been consistently duplicated. We would also have liked to assess the personality and approach of the respective teachers in our experiment to evaluate whether this variable correlated with aggressive behavior in children. Another useful computation would have been to compre classes within school A to see if there were significant differences between them, or not. Still another relevant study would be to retest the boys of grades 4,5 or 6 in school B in three or four years when their school joins the ranks of the "overcrowded" as is forecast by enrollment trends and waiting lists, and the administration's propensities, to see whether significant differences are obtained. Last, but not least, we wish we had an equivalent test for girls as they are an intrinsic part of the school population, and the presence of their scores would have been an essential complement to our study.

But, beyond that, our own study and our readings raise in our minds, a more important and wider question, namely, the special consideration we ought to give to the need for "personal space", especially perhaps in the case of children who have not yet accumulated enough emotional resources to rise above the assaults made on their "human dignity" by overcrowded conditions. In fact, study after study quoted in "Big School, Small School" (Barker and Gump, 1964), show that persons in large schools feel no sense of responsibility, are less motivated towards participation, are seen as less effective and less influential, are more dissatisfied with group members, etc. It is not too difficult to speculate that when students feel redundant to their settings, they may also feel either alienated from it or angry at it, for social man needs affiliation and a sense of usefulness as surely as he needs his daily bread.

While adaptation may and probably does occur, it may take, as Milgram suggests, "the form of gradual evolution of norms of behavior." And in that author's words: "the ultimate adaption to an overloaded situation is to totally disregard the needs, interests and demands of those whom one does not define as relevant to the satisfaction of personal needs." We have to confront the possibility that our neglect and indifference in this area may breed rather frightening new "norms of behavior", frightening in their implications to our very humaneness. It is a question of deciding which human characteristics we deem essential to our society, and which are intolerable, and then having the courage, energy and persistence to oppose unacceptable standards.

References

Proshansky, H.M., Ittelson, W.H., and Rivlin, L.G. "Freedom of Choice and Behavior in a Physical Setting", as quoted in "Environmental Psychology, Man and his Physical Setting" by the same authors, Holt, Rinehart and Winston, N.Y., 1970, p. 27.

Matsushima, Hohn. "An Instrument for Classifying Impulse Control Among Boys", Journal of Consulting Psychology, 1964, Vol. 28, (1), 87-90.

Johnson, O.G., Bommarito, J.W. "Tests and Measurements in Child Development: A Handbook", Jossey-Bass Inc. Publishers, San Francisco, 1971, p. 472.

Barker, R., and Gump, P.V. Editors, "Big School, Small School", Stanford, California: Stanford University Press, 1964, P. 45.

Milgram, S. "The Experience of Living in Cities" Science, 1970, 13, 141-168.

Aggression As A Function Of Birth-Order.

Betty Lewittes, Joanne Donahue

Aggressive tendency is one of the many complex traits that comprise an assessment of human personality. Various definitions have been put forth, often differing greatly because of the lack of general agreement as to just what kinds of behaviour and motivation should be included. A very general definition has been offered by Arnold Buss (1961) as it being "a response that delivers noxious stimuli to another organism"; the aspect of intent was not included because of the obvious difficulty in implying its presence in behavioral events. According to this definition, aggression is different from anger (which is an emotional reaction and can be conceptualized as a drive state) and hostility (which is a negative attitude, with implicit verbal responses, and can occur in the absence of aggression and vice-versa) although they are closely related.

Previous studies have shown that differences in aggressive behavior are the results of the influence of many variables, such as social-class differences, sex differences and birth-order differences. Studies of the effect of birth-order have shown with few exceptions that first-born children are less aggressive than their later-born siblings, who generally tend to show weaker impulse control (Goodenough & Leahy, 1927; Patterson & Ziegler, 1941; P. Sears, 1951). These effects have been especially evident in male children (Koch, 1955; MacFarlane, Allen & Honzig, 1954) although Pauline Sears (1951) found significantly greater doll-play aggression for later-born females as compared to first-born females. The data from previous studies has been highly contradictory, and as yet there has emerged no clear-cut pattern concerning the effect of any of these variables.

The purpose of this investigation was to examine the scores achieved by subjects on an Inventory measuring aggression, and then to determine whether or not a relationship could be shown to exist between these scores and the subjects' ordinal positions within the family. Although the technique of the questionnaire is totally dependent upon the subjects' honesty, the investigators, being undergraduates, did not consider themselves competent to employ one of the other techniques for assessing aggression, such as analysis of play situations, observations, experimental frustration or projective techniques, since therese involve far greater experience.

Method

Subjects: Fifty-five children, from a relatively homogeneous socio-economic background, each of whom came from families of three or more children, were used for this experiment. They ranged in age from ten to sixteen, and each sub-group (ie, 1st, 2nd and 3rd born) was equated for number and sex.

Apparatus (Materials): The questionnaire used was the Buss-Durkee Aggression Inventory (1957). It differs from others (e.g. MMPI, EPPI) in that its rationale is based on the assumption that it is both useful and necessary to classify the varieties of aggressive behavior into several sub-classes, instead of merely employing one aggregate score for all types of aggressive behavior. The sub-classes are delineated as (1) assault; (2) indirect aggression; (3) irritability; (4) negativism; (5) resentment; (6) suspicion; (7) verbal; also included was a guilt factor, in order to observe the inhibiting influence of guilt on aggressive tendencies. In all, the Inventory contained 75 items - 66 measuring the various types of hostility outlined above and 9 measuring guilt. When assessed by independent groups of judges, this Inventory was found to be relatively free from the influence of the "social-desirability" variable, which accounts for much of the variance of normal responses.

1.	Total 1>Total 2	t .72	df 39	p>.20	Accept H_o
2.	Total 1>Total 3	t .61	df 31	p>.20	Accept H_o
3.	Total 2<Total 3	t .14	df 34	p>.20	Accept H_o
4.	Females>1 Females 2	t .68	df 19	p>.20	Accept H_o
5.	Females>1 Females 3	t 1.065	df 15	p>.20	Accept H_o
6.	Females>2 Females 3	t .199	df 16	p>.20	Accept H_o
7.	Males 1>Males 2	t .246	df 18	p>.20	Accept H_o
8.	Males 1<Males 3	t .253	df 14	p>.20	Accept H_o
9.	Males 2<Males 3	t .508	df 16	p>.20	Accept H_o
10.	Total M's<Total F's	t .22	df 53	p>.20	Accept H_o
11.	Males 1<Females 1	t .68	df 17	p>.20	Accept H_o
12.	Males 1>Females 2	t .112	df 18	p>.20	Accept H_o
13.	Males 1>Females 3	t .386	df 14	p>.20	Accept H_o
14.	Males 2<Females 1	t .979	df 19	p>.20	Accept H_o
15.	Males 2<Females 2	t .085	df 20	p>.20	Accept H_o
16.	Males 2>Females 3	t .167	df 16	p>.20	Accept H_o
17.	Males 3<Females 1	t .42	df 15	p>.20	Accept H_o
18.	Males 3>Females 2	t .3	df 16	p>.20	Accept H_o
19.	Males 3>Females 3	t .659	df 12	p>.20	Accept H_o

Assault:

20.	Males 1>Males 2	t 1.4	df 18	p>.10	Accept H_o
21.	Males 1>Males 3	t .58	df 14	p>.20	Accept H_o
22.	Males 2<Males 3	t .72	df 16	p>.20	Accept H_o
23.	Females 1=Females 2	t 0	df 19	p>.20	Accept H_o
24.	Females 1>Females 3	t 1.63	df 15	p>.10	Accept H_o
25.	Females 2>Females 3	t 1.27	df 16	p>.20	Accept H_o
26.	Total M's>Total F's	t 2.51	df 53	f<.02	Reject H_o

Verbal:

27.	Males 1<Males 2	t 1.02	df 18	p>.20	Accept H_o
28.	Males 1<Males 3	t .614	df 14	p>.20	Accept H_o
29.	Males 2>Males 3	t .45	df 16	p>.20	Accept H_o
30.	Females 1>Females 2	t 1.21	df 19	p>.20	Accept H_o
31.	Females 1>Females 3	t .96	df 15	p>.20	Accept H_o
32.	Females 2<Females 3	t .06	df 16	p>.20	Accept H_o
33.	Total M's>Total F's	t .24	df 53	p>.20	Accept H_o

Irritability:

34.	Males 1<Males 2	t .416	df 18	p>.20	Accept H_o
35.	Males 1>Males 3	t .727	df 14	p>.20	Accept H_o
36.	Males 2>Males 3	t 1.38	df 16	p>.20	Accept H_o
37.	Females 1>Females 2	t 1.22	df 19	p>.20	Accept H_o
38.	Females 1>Females 3	t .8	df 15	p>.20	Accept H_o
39.	Females 2<Females 3	t .447	df 16	p>.20	Accept H_o
40.	Total M's<Total F's	t 1.82	df 53	p>.05	Accept H_o

Guilt:

41.	Males 1<Males 2	t .52	df 18	p>.20	Accept H_o
42.	Males 1<Males 3	t .162	df 14	p>.20	Accept H_o
43.	Males 2>Males 3	t .36	df 16	p>.20	Accept H_o
44.	Females 1<Females 2	t .208	df 19	p>.20	Accept H_o
45.	Females 1<Females 3	t .097	df 15	p>.20	Accept H_o
46.	Females 2>Females 3	t .133	df 16	p>.20	Accept H_o
47.	Total M's<Total F's	t 2.086	df 53	p<.05	Reject H_o

Correlations between "assault" and "verbal":

48.	Males 1 (P-M)	r .21	t .5678	df 7	p>.20	Accept H_o
49.	Males 1 (R-O)	r .302	t .842	df 7	p>.20	Accept H_o
50.	Males 2 (P-M)	r .094	t .29	df 9	p>.20	Accept H_o
51.	Males 2 (R-O)	r .11	t .33	df 9	p>.20	Accept H_o
52.	Males 3 (P-M)	r .53	t 1.42	df 5	p>.20	Accept H_o
53.	Males 3 (R-O)	r .48	t 1.23	df 5	p>.20	Accept H_o
54.	Females 1(P-M)	r .125	t .35	df 8	p>.20	Accept H_o
55.	Females 1(R-O)	r .082	t .233	df 8	p>.20	Accept H_o
56.	Females 2(P-M)	r .272	t .84	df 9	p>.20	Accept H_o
57.	Females 2(R-O)	r .514	t 1.79	df 9	p>.20	Accept H_o
58.	Females 3(P-M)	r-.21	t- .47	df 5	p>.20	Accept H_o
59.	Females 3(R-O)	r-.008	t- .019	df 5	p>.20	Accept H_o

Correlations between "aggression" and "guilt":

60.	Males 1 (P-M)	r .72	t 2.72	df 7	p <.05	Reject H_o
61.	Males 1 (R-O)	r .705	t 2.63	df 7	p <.05	Reject H_o
62.	Males 2 (P-M)	r .42	t 1.17	df 9	p =.20	Accept H_o
64.	Males 3 (P-M)	r .44	t 1.1	df 5	p >.20	Accept H_o
63.	Males 2 (R-O)	r .365	t 1.17	df 9	p >.20	Accept H_o
65.	Males 3 (R-O)	r .464	t 1.17	df 5	p >.20	Accept H_o

66.	Females 1 (P-M)	r- .32	t- .95	df 8	$p > .20$	Accept H_o
67.	Females 1 (R-O)	r- .28	t- .816	df 8	$p > .20$	Accept H_o
68.	Females 2 (P-M)	r .52	t 1.83	df 9	$p = .10$	Accept H_o
69.	Females 2 (R-O)	r .67	t 2.69	df 9	$p < .05$	Reject H_o
70.	Females 3 (R-O)	r .09	t .203	df 5	$p > .20$	Accept H_o
71.	Females 3 (R-O)	r .196	t .45	df 5	$p > .20$	Accept H_o

Procedure: The questionnaires were administered anonymously and with the clear understanding that they were unrelated to the students' school-work. Each subject marked only his sex and ordinal position on his paper. After scoring, the papers were separated into the 3 sub-groups, according to birth-order. While an aggregate score on the 7 hostility factors (guilt was not included) was used for the purposes of this investigation, the scores were also broken down into the separate factors for more intensive investigation. The data were analyzed for significance between the means of each group according to birth-order; for the significance between the means of each of the sexes within each (birth-order) sub-group; for the significance between the means between the sexes and each birth-order sub-group. Then, the factors "assault", "irritability", "verbal", and "guilt" were each separately analyzed for the significance between the means of the sexes as whole groups as well as between the sexes of each sub-group. Also performed were correlations for each sub-group according to sex between the factors "assault" and "verbal"; and the correlation between the aggregate score and the factor "guilt". In all of the statistical tests performed, the Null Hypothesis stated that there was no significant difference between the means of the groups, or no significant relationship between the variables.

Results and Discussion

The analysis of the aggression scores as related to birth-order yielded no significant differences. Contrary to expectations derived from previous studies, our results showed that the mean score of first-born (males and females together) exceeded that of the later-born siblings (Result #1 & 2). Only when the subjects were divided into groups based on sex and birth-order did we find a case where the mean score of first-borns was less than that of siblings (R #8). However, here, as in the above cases cited, the differences were not significant. Similarly, when the data were analyzed on the basis of sex, the results were contrary to the usual findings, in that the mean score for females exceeded the mean score for males (R #10), with first-born females achieving the highest mean score for all groups. Again, the differences were not significant. When the various factors which make up the total aggression score were separately analyzed, several differences emerged; however, these were related to sex, not to ordinal position. For example, the mean score for males on the factor "assault" was significantly greater than the mean score for females (R #26), which is consistent with the findings of earlier studies (Sanford et al, 1943; Sears, 1961; Wyer et al, 1965). Contrary to the findings of earlier studies (N. Feshbach, 1965), the mean score for males on the factor "verbal" was greater than the mean score for females (R #33), but this difference was not significant. The greater mean score for females on the factor "irritability" was also not significant (R #40). The mean score for females on the factor "guilt" was significantly greater than the mean score for males (R #47), which is consistent with other studies (Sears, 1961; Wyer et al, 1965). Tests of correlation between the factors "assault" and "verbal" indicated no significant relationships. Tests of correlation between the aggregate scores and the factor "guilt" indicated some significant relationships, but the meaning of these is unclear.

Some explanations may be in order for the above results. Because the subjects were all from middle-class Jewish families, it may be that even their first-born are more aggressive as a result of the possibly high expectations of their families. Furthermore, the mean scores may have been significantly affected by the variance in age of the subjects; it might have been more meaningful to have tested an equal number of subjects of the same age for each ordinal position. Thirdly, the

limitations of available subjects forced us to supplement some of the groups with other "middle" children (ie., in order to equate the groups for number and sex, some 3rd of 4-children were added to the 2nd-born category), and this adjustment may have had some effect on the mean scores.

Thus, all that can be said, with any degree of confidence based on the subjects used for this investigation, is that there appears to be no significant relationship between the scores achieved on an inventory measuring aggressiveness and the subjects' birth-order positions within the family.